

August 15, 2006

MEMORANDUM

TO: Mr. Steve Murray, P.L.S. - Tippecanoe County Surveyor

FROM: David W. Eichelberger, P.E. - CBBEL, Indianapolis

PROJECT: **Clarian Arnett Hospital
CBBEL Project No. 02-038 (FK)**

DEVELOPER/OWNER: **Clarian Health and Arnett Clinic**

LOCATION: **40° 24' 05" Latitude
-86° 48' 13" Longitude**

RECOMMENDATION: **Final Approval with Conditions**

The Clarian Arnett Hospital will be developed on an approximately 115 acre site located east of County Road 500 East, just south of McCarty Lane. This portion of the project will develop approximately 62 acres of the 115 acre site and will include a new hospital building, a 125,000 square foot medical office building, powerhouse, parking lots, access drives, storm sewer, utility infrastructure, and water quality basins. Under existing conditions, stormwater sheet flows to the Julius Berlowitz Regulated Drain. Upon completion of the proposed development, storm water will continue to outlet to the regulated drain, and will be tributary to the Berlowitz Regional Detention Facility.

The Felbaum Branch of the Berlowitz Regulated Drain exists at the project site. This portion of the project does not include any disturbance to the existing tile. This project will have an indirect outlet to the Berlowitz Regulated Drain. There are no proposed regulated drain crossings or encroachments proposed with this project. The project is not located within a 305(b) Priority Watershed. The project site is within the Tippecanoe County MS4 Area.

This project was previously reviewed in memorandums dated July 21 and August 1, 2006. After a review of the most recently provided information, CBBEL recommends final approval of the stormwater management plan with the following conditions:

Variances/Encroachments

There are no variances or regulated drain encroachments proposed with this project.

Stormwater Quantity

1. The applicant should notify Caterpillar Logistics (adjacent property to the south) in accordance with Chapter 3, Section 2.C of the Ordinance. This notification is required due to the emergency overflow routing of a portion of the site to the south.
2. The applicant should provide a final complete and comprehensive bound certified drainage report containing all revisions.

3. Per conversations with the applicant, the critical duration analyses for the contributing watershed to each pond and for the routing of each pond is being revised due to modeling problems with the distribution. The critical duration 100-year frequency elevation for each pond must be provided on the plans. The durations should include the 0.5, 1.0, 1.5, 2.0, 3.0, 6.0, 12.0, and 24.0 hour storms. The results should be summarized in the drainage report.
4. The applicant should provide all modeling input and output reports. The applicant need only provide the 10-year and 100-year modeling input and output.
5. Based on revised modeling results, the applicant should provide a capacity analysis for the downstream twin culverts under McCarty Lane at the bridge over I-65. This analysis should verify the ability of the culverts to convey critical duration peak discharges for the entire contributing watershed (including the hospital site and all off-site areas) without impacting I-65. Both the currently proposed development and the entire hospital property under fully developed conditions with off-site areas should be checked.
6. Pond "A-1 to A-4" and "B-1" outlet pipes should be profiled on the plans to allow verification of the modeling input data.
7. Pond "A" outlet structure has a 6'x1' overflow opening. This opening should be set-up in the orifice/culvert section to allow proper input with a rise and span instead of in the weir section.
8. The applicant should review the storm sewer sizing drainage basin map, the runoff coefficient "C" calculations and the basin runoff calculations to ensure all values correlate between the map and calculations. There are several discrepancies between the map and calculations.
9. The applicant should review the storm sewer sizing calculations to ensure that all sections are correctly labeled to correspond with the basin map and parameter calculations. The calculations should clearly identify the size of the elliptical storm sewer.
10. All sections of storm sewer should be profiled on the plans, including outlet structures and pipes from the water quality basins. The profiles should label all portions of the system and correspond with the plans and basin map. Several sections are not profiled and are missing labels.
11. The runoff used for the inlet capacity calculations should correlate with the basin runoff calculations. There are several discrepancies. The inlets should be sized for 50% clogged conditions with a maximum ponding depth of 7". An exhibit showing the maximum ponding depths and limits should be provided. The type of casting should be provided on the plans so the weir length and area used in the calculations can be verified.
12. The applicant should provide emergency spillway sizing calculations based on the revised peak 100-year critical duration inflow to each basin and multiplied by 125%. The emergency spillways should be labeled and dimensioned on the grading plans. A detail of each spillway should be provided on the plans.
13. The applicant should provide an emergency flood routing exhibit showing the overflow paths throughout the project. These overflow paths must be clearly shown on the plans and be directed to the ponds and not off-site. Any building that may be impacted should have the pad elevations set according to Chapter 4, Section M of the Standards. Emergency overflows may not exceed a maximum depth of 7" in the streets or parking lots.

14. The applicant should determine the allowable release rates based on the unit discharge rates found in Table 3-1 of the Ordinance for the onsite area only, and provide the necessary calculations to determine the storage volume that would have been required to meet these release rates, based on the currently proposed development. The required volume will be used to determine compensation for the Berlowitz Drain Regional Detention System. This should be summarized in the drainage report.
15. Any vacation, reconstruction, or relocation of the Felbaum Branch of the Berlowitz Regulated Drain must be coordinated with the Tippecanoe County Surveyor's Office. Any vacation, reconstruction, or relocation will also require final approval from the Tippecanoe County Drainage Board. The Felbaum Branch Tile should be field located.

Stormwater Quality

1. Provide a separately bound comprehensive Operations and Maintenance (O&M) Manual for all post-construction stormwater quality measures. The O & M manual should contain the owner's name and contact information, specific information about the BMPs used, inspection and maintenance information and forms, and a legible location map that identifies all proposed BMP measures.
2. The stormwater quality calculations for the proposed BMP measures appear to show that the combination of the BMP measures will provide the minimum 80% TSS removal. However, it is not clear how the values in the treatment train calculations, which are multiplied by the (total percent) to each measure where derived.
3. Provide a completed and signed copy of the "Commercial Property Recorded Master Covenant and Agreement Regarding On-Site BMP Maintenance and Drainage".

General Conditions

1. The applicant must present the project at the Tippecanoe County Drainage Board meeting for the project to be considered for approval
2. The applicant should obtain approval from the City of Lafayette Engineer's Office for the proposed project connection to the storm sewer along C.R. 500 East.
3. The applicant should obtain approval from the Tippecanoe County Highway Department for all work proposed within the C. R. 500 East and McCarty Lane rights-of-way.
4. The applicant must pay any final drainage review fees per Ordinance 2005-04-CM and submit a letter to the County Surveyor's Office stating that these fees will be paid.
5. **All listed conditions must be completely addressed before any drainage infrastructure can be installed at the site, and before final plan approval and sign-off will be granted by the County Surveyor's Office.**

No error or omission in the plans, calculations or applications (whether said plans, calculations or applications have been reviewed by the review engineer or not) shall permit or release the applicant and designer from constructing this work in any other manner than that provided for in the County Ordinance.

pc: Gresham, Smith & Partners
DWE/sb
M02-038FK3.DOC